MATERIAL SAFETY DATA SHEET

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SRM Number: 3014
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SRM Name: 1,2,3-Trichloropropane in Methanol

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SECTION I. MATERIAL IDENTIFICATION

Material Name: 1,2,3-Trichloropropane in Methanol

Description: SRM 3014 consists of two 5-milliliter sealed borosilicate glass ampoules, each containing approximately 2.5 mL of a solution of 1,2,3-trichloropropane in methanol.

Other Designations: 1,2,3-Trichloropropane (allyl trichloride; glycerol trichlorohydrin; glycerin trichlorohydrin; glyceryl trichlorohydrin; trichlorohydrin) in **Methanol** (methyl alcohol; wood alcohol; methyl hydroxide; carbinol; monohydroxymethane; wood spirit; wood naphtha; methylol)

Name	Chemical Formula	CAS Registry Number
Methanol	CH_3OH	67-56-1
1,2,3-Trichloropropane	$CH_2ClCHClCH_2Cl$	96-18-4

DOT Classification: Methanol; UN1230; Packing Group II; Hazard Class 3.

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Methanol	99	OSHA TWA: 260 mg/m^3 (200 ppm)
		NIOSH recommended TWA (skin): 260 mg/m^3 (200 ppm) (10 h)
		NIOSH recommended STEL (skin): 325 mg/m^3 (250 ppm)
		UK WEL TWA (skin): 266 mg/m^3 (200 ppm)
		UK WEL STEL (skin): 333 mg/m^3 (250 ppm)
		Human, Inhalation TC_{LO}: 86 000 mg/m^3
		Human, Oral LD_{LO}: 143 mg/kg
		Man, Oral TD_{LO}: 3 429 mg/kg
1,2,3-Trichloropropane	1	OSHA TWA: 300 mg/m^3 (50 ppm)
		ACGIH TWA (skin): 10 ppm
		NIOSH recommended TWA (skin): 60 mg/m^3 (10 ppm) (10 h)
		Rat, Oral LD_{50}: 108 μL/kg
		Rat, Inhalation LC_{LO}: 500 ppm (4 h)
		Rat, Intermittent Oral TD_{LO}: 2 720 mg/kg (17 weeks)

Carcinogenic, Tumorigenic, Mutagenic Reproductive Data: 1,2,3-Trichloropropane has been investigated as a carcinogenic, tumorigenic, reproductive, and mutagenic effector. Methanol has been investigated as a mutagenic and reproductive effector.

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Methanol	1,2,3-Trichloropropane
Appearance and Odor: a clear, colorless liquid with a characteristic alcoholic odor	**Appearance and Odor:** a clear, colorless to yellow liquid with an irritating odor
Relative Molecular Mass: 32.04	**Relative Molecular Mass:** 147.43
Density: 0.7914 g/m^3	**Density:** 1.39 g/m^3
Boiling Point: 65 °C (149 °F)	**Boiling Point:** 156 °C (313 °F)
Freezing Point: –94 °C (–137 °F)	**Freezing Point:** –15 °C (5 °F)
Vapor Pressure (@ 20 °C): 97.25 mmHg	**Vapor Pressure (@ 20 °C):** 3.4 mmHg
Evaporation Rate (butyl acetate = 1): 4.6	**Evaporation Rate:** not available
Viscosity (@ 20 °C): 0.59 cP	**Viscosity:** not available
Solubility in Water: soluble	**Solubility in Water:** 0.19 %
Solvent Solubility: soluble in ether, benzene, alcohol, acetone, chloroform, ethanol, ketones, and most organic solvents	**Solvent Solubility:** soluble in chloroform, alcohol, ether, acetone, toluene, and octanes

NOTE: The physical and chemical data provided are for the pure components. Physical and chemical data for this methanol/1,2,3-trichloropropane solution do not exist. The actual behavior of the solution may differ from the individual components.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Methanol

Flash Point: 11 °C **Method Used:** Closed Cup

Autoignition Temperature: 385 °C

Flammability Limits in Air (Volume %): **UPPER:** 36
LOWER: 6.0

1,2,3-Trichloropropane

Flash Point: 76 °C **Method Used:** Closed Cup

Autoignition Temperature: 304 °C

Flammability Limits in Air (Volume %): **UPPER:** 12.6
LOWER: 3.2

Unusual Fire and Explosion Hazards: Methanol is a severe fire hazard. 1,2,3-Trichloropropane is a moderate fire hazard. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back. Vapor and air mixtures are explosive above flash point.

Extinguishing Media: Use alcohol-resistant foam, regular dry chemical, carbon dioxide, or water spray.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Stability: **X** **Stable** ____ **Unstable**

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid contact with heat, sparks, flames, or other sources of ignition. Avoid inhalation of vapors or combustion by-products. Keep out of water supplies and sewers.

Incompatibility (Materials to Avoid): This material is incompatible with halo carbons, combustible materials, metals, oxidizing materials, halogens, metal carbide, amines, acids, and bases.

See Section IV**: "**Unusual Fire and Explosion Hazards".

Hazardous Decomposition or Byproducts: Thermal decomposition products may include toxic oxides of carbon, hydrogen chloride, and various organic fragments.

Hazardous Polymerization: ____ **Will Occur** **X** **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **X** **Inhalation** **X** **Skin** **X** **Ingestion**

Methanol: Methanol is a skin and eye irritant and can cause nerve damage. This material is harmful if inhaled or absorbed through skin. Ingestion may be fatal or cause blindness. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause damage to the eyes, liver, heart, and kidneys. Methanol may also cause gastrointestinal disturbances and convulsions.

1,2,3-Trichloropropane: 1,2,3-Trichloropropane may be harmful by inhalation, ingestion, or skin contact. Eye contact of vapors to 100 ppm for 15 min can cause irritation. Repeated or prolonged contact may cause conjunctivitis. Direct contact to skin may cause irritation. 1,2,3-Trichloropropane may be absorbed through the skin to cause systemic toxicity as detailed in acute inhalation. Repeated of prolonged skin contact with vapors may produce dermatitis. Acute exposure by inhalation to 100 ppm for 15 min may cause throat irritation. A single respiration of 125 ppm to 2 151 ppm can cause eye and nasal irritation, labored respiration, inactivity, and liver enzyme changes with death occurring at the higher concentrations. Death may be due to respiratory failure or cardiac arrest. Kidney damage may also occur. Ingestion of 1,2,3-trichloropropane may cause upper gastrointestinal irritation and central nervous system depression.

Medical Conditions Generally Aggravated by Exposure: 1,2,3-Trichloropropane exposure may aggravate kidney disorders, liver disorders, respiratory disorders, and skin disorder. May also aggravate allergies. **Methanol** may cause eye disorders, kidney disorders, skin disorders, and allergies.

Target Organ(s) of Attack: Central nervous system (CNS).

Listed as a Carcinogen/Potential Carcinogen (Methanol):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

Listed as a Carcinogen/Potential Carcinogen (1,2,3-Trichloropropane):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	X	
In the International Agency for Research on Cancer (IARC) Monographs	X	
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration by qualified personnel. Obtain medical assistance if necessary.

Ingestion: If ingested, obtain medical assistance immediately.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released or Spilled: DO NOT touch spilled material. Reduce vapors with water spray. Avoid heat, flames, sparks, and other sources of ignition. Stop the leak if one can do so without risk. Absorb small spills with sand or other non-combustible absorbent material and place into containers for proper disposal. Keep out of water supplies and sewers. 1,2,3-Trichloropropane is subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).

Waste Disposal: Follow all federal, state, and local laws governing disposal. Methanol is subject to disposal regulations U.S. EPA 40 CFR 262, Hazardous Waste Number U154.

Handling and Storage: Store and handle in accordance with all current regulations of standards. Keep methanol and 1,2,3-trichloropropane separated from incompatible substances. Persons handling this material must wear protective eyewear, clothing, and gloves to prevent contact with this material. Methanol and 1,2,3-trichloropropane are subject to storage regulations: U.S. OSHA 29 CFR 1910.106.

Sealed ampoules of SRM 3014 should be stored in the dark at temperatures between 10 °C and 30 °C. Protect containers from physical damage.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS *1,2,3-Trichloropropane*, 15 September 2005.
MDL Information Systems, Inc., MSDS *Methyl Alcohol*, 16 June 2005.